

What is claimed is:

1        1. A thin film transistor, comprising:  
2        a cooling layer formed on a substrate,  
3        an insulating layer formed on said cooling layer, a heat  
4 conductivity of said cooling layer being higher than that of said  
5 insulating layer, and  
6        a semiconductor layer which is formed on said insulating layer  
7 and comprises a drain region, a channel region and a source region,  
8        wherein said cooling layer is locally close to at least one  
9 of said drain region, said channel region and said source region.

1        2. A thin film transistor according to claim 1, wherein:  
2        at least one of said drain region, said channel region and  
3 said source region is shaped to be close to said cooling layer .

1        3. A thin film transistor according to claim 1, wherein:  
2        said cooling layer is shaped to be close to said at least one  
3 of said drain region, said channel region and said source region.

1        4. A thin film transistor according to claim 1, wherein:  
2        a gate electrode is formed on said channel region, and said  
3 drain region closely approaches said cooling layer.

1        5. A thin film transistor according to claim 1, wherein:  
2 said cooling layer has a light-shading property.

1        6. A method for fabricating a thin film transistor, comprising

2 the steps of:

3 forming a cooling layer with a high heat conductivity on  
4 a substrate,

5 forming an insulating layer with a lower heat conductivity  
6 than that of said cooling layer on said cooling layer,

7 locally thinning said insulating layer,

8 forming a semiconductor layer on said locally thinned insulating  
9 layer, and

10 irradiating said locally thinned insulating layer with an energy  
11 beam.

1 7. A method for fabricating a thin film transistor, comprising  
2 the steps of:

3 forming a semiconductor layer on a substrate,

4 forming a cooling layer with a higher heat conductivity than  
5 that of said semiconductor layer on said semiconductor layer,

6 patterning said cooling layer,

7 irradiating said semiconductor layer and said cooling layer  
8 with an energy beam, and

9 removing at least a portion of said cooling layer.

1 8. A thin film transistor fabricated on an insulating layer  
2 formed on a substrate, comprising:

3 an insulated gate electrode; and

4 an active layer including a source region, a drain region and  
5 a channel region which are composed of a semiconductor layer  
6 formed on said insulating layer;

7 wherein a part of said active layer is of a single crystal

8 layer.

1 9. The thin film transistor as defined in claim 8, wherein:  
2 a rest of said active layer is of a polycrystalline layer.

1 10. The thin film transistor as defined in claim 8, wherein:  
2 said part of said active layer is said channel region.

1 11. The thin film transistor as defined in claim 8, wherein:  
2 said rest of said active layer comprises said source region  
3 and said drain region.